



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,876	02/20/2004	Cheng-Cheng Liu	BHT-3183-65	5151
7590 08/25/2005 TROXELL LAW OFFICE PLLC SUITE 1404 5205 LEESBURG PIKE FALLS CHURCH, VA 22041			EXAMINER VU, HUNG K	
			ART UNIT 2811	PAPER NUMBER

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/781,876	Applicant(s) LIU, CHENG-CHENG	
	Examiner Hung Vu	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Request for Continued Examination

1 A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/08/05 has been entered. An action on the RCE follows.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 13, 17, 20, 21 and 23 are rejected under 35 U.S.C. 102(a) as being anticipated by Lin (PN 6,677,668, of record).

Lin discloses, as shown in Figures 2A-2C and 5A-5B, a multi-chip package combining wire-bonding and flip-chip configuration comprising:

a substrate (110) having an upper substrate surface and a lower substrate surface, the upper substrate having a plurality of contact pads;

Art Unit: 2811

at least a wire-bonding chip (120) connected to the upper substrate surface and electrically connected to the substrate by a plurality of bonding wires;

a molding compound (125) formed on the upper substrate surface covering each of the at least one wire-bonding chip and the plurality of bonding wires, the molding compound having:

two extensions;

at least one recession located between the two extensions, the two extensions being spaced apart from the plurality of contact pads;

at least one flip-chip electrical device (160', 160 or 170) having a plurality of bumps electrically connected to the plurality of contact pads of the substrate.

Regarding claim 17, Lin discloses the at least one recession includes two recessions, the two recessions are symmetrical.

Regarding claim 20, Lin discloses the flip-chip type electrical device is a BGA package, a chip scale package or a flip-chip.

Regarding claim 21, Lin discloses the package further comprising a plurality of solder balls on the lower substrate surface.

Regarding claim 23, Lin discloses the molding compound has at least a step on the exposed surface of the molding compound.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14 – 16 and 18 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (PN 6,677,668, of record).

Regarding claim 14, Lin discloses the claimed invention including the package as explained in the rejection above. Lin does not disclose a distance between the at least one recession and a closest contact pad of the plurality of contact pads is greater than 1.0 mm. Although Lin does not teach the distance between the at least one recession and a closest contact pad of the plurality of contact pads, as that claimed by Applicant, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the recession having a desired distance, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 15 – 16 and 18 – 19, Lin discloses the claimed invention including the package as explained in the rejection above. Lin does not disclose the recession has an arc shape or a shape of a quarter- of a circle, and the molding compound has an L-shape or an U-shape. However, the shape differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. It appears that these

Art Unit: 2811

changes produce no functional differences and therefore would have been obvious. Note *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Circ. 1990).

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (PN 6,677,668, of record) in view of Bernier et al. (PN 5,847,929, of record).

Lin discloses the claimed invention including the package as explained in the rejection above.

Lin does not disclose the package further comprising a heat sink connected to the molding compound and the at least one flip-chip electrical device. However, Bernier et al. discloses a package combining wire-bonding and flip-chip configuration comprising a heat sink (224, 540) connected to the molding compound and at least one flip-chip electrical device. Note Figures 1-8 and 11-14 of Bernier et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the package of Lin further comprising a heat sink, such as taught by Bernier et al. in order to reduce the heat generating in the package.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (PN 6,677,668, of record) in view of Chung et al. (PN 6,525,406, of record).

Lin discloses the claimed invention including the package as explained in the rejection above.

Lin does not disclose the molding compound has at least an indentation located on a surface opposite the substrate. However, Chung et al. discloses a package comprising a molding compound having at least an indentation (48) located on a surface opposite the substrate. Note Figure 7 of Chung et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the molding compound of Lin having at least an

Art Unit: 2811

indentation located on a surface opposite the substrate, such as taught by Chung et al. in order to serve as a recognition mark for marking the molding compound.

6. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (PN 6,677,668, of record) in view of Tao et al. (PN 6,191,360, of record).

Lin discloses the claimed invention including the package as explained in the rejection above.

Lin does not disclose the substrate has a molding gate metal layer. However, Tao et al. discloses a substrate (30) has a molding gate metal layer (32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the substrate of Lin having a molding gate metal layer, such as taught by Tao et al. in order to assist in removing the molding compound formed on top of the molding gate metal layer.

Response to Arguments

7. Applicant's arguments with respect to claim 13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday-Friday 6:00-4:30, Eastern Time.

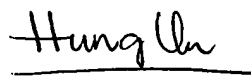
Art Unit: 2811

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Steven Loke can be reached on (571) 272-1657. The Central Fax Number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

August 22, 2005

A handwritten signature in black ink, appearing to read "Hung Vu", written over a horizontal line.

Hung Vu

Primary Examiner